

Remarks

Applicants respond hereby to the outstanding Office Action mailed on May 25, 2007. A Petition For Extension of Time accompanies this Amendment, extending the time for applicants' reply one (1) month, up to and including September 25, 2007. Pending independent claims 13 and 20 are currently amended hereby, and new independent claims 23 and 24 are presented for examination. No new matter has been entered. Accordingly, claims 13-16 and 20-24 are pending for prosecution hereinafter, where claims 13, 20, 23 and 24 are the currently pending independent claims.

In the outstanding Office Action, claims 13 and 20 were objected to, claims 13-16 and 20-22 were rejected under 35 USC §112, first paragraph, claims 13-16 were rejected under 35 USC §112, second paragraph, claims 13 and 14 were rejected under 35 USC §102(b) as anticipated by US Patent No. 688,009 to Siegel, et al. (Siegel), and claims 15 and 16 were rejected under 35 USC §103(a) in view of Siegel.

Response To Objections

In response to the objections to claims 13 and 20, applicants have amended those claims in a way that obviates the objections, and respectfully request that the objections be withdrawn in view of those claims amendments.

Response to Rejections Under 35 USC §112, First Paragraph

Claims 13-16 and 20-22 were rejected under 35 USC §112, first paragraph. The Examiner asserts with respect to claims 13 and 20, that the specification, when describing the third embodiment (to which it appears the claims are directed), fails to mention that the switch

(72, starting on 16, last paragraph) operates so as to “convert the first current or the second current to a third current” or “convert the first voltage or the second voltage to a third voltage”. The Examiner further asserts that instead, the power converting circuitry is explicitly disclosed as not being required in the third embodiment (note page 17, lines 3-5), and that the specification only supports that the switch “selectively connects any one of the first power unit and the second power unit to the function executing unit for a predetermined period.”

In response, applicants respectfully assert that the text referred to by the Examiner at the paragraph beginning at line 21 of page 16, through line 5 of page 17 is directed to Fig. 11 power-supply circuit 70, including two sets of cells and switch 72. Each set 71 includes two silver oxide batteries, and the switch switches to any one of the sets. More particularly, the text at lines 3-5 of page 17 states that the embodiment does not require step-up, or step-down circuitry (power converting circuitry), but only the power unit (70) elements required for switching operation in accordance with the invention, as set forth in the Specification.

Applicants have amended claims 13 and 20 to cancel the language describing operation “to convert” the first current or the second current, and “to convert” the first voltage or the second voltage, etc., as shown above in the Listing of Claims. Applicants, therefore, believe that claims 13-16 and 20-22 as amended comply with the requirements of 35 USC §112, first paragraph, as fully supported by the Specification, and respectfully request withdrawal of the rejection of claims 13-16 and 20-22 thereunder.

Response to Rejections Under 35 USC §112, Second Paragraph

Claims 13-16 were rejected under 35 USC §112, second paragraph. The Examiner asserts with respect to claim 13, from which claims 14-16 depend, that it is unclear as to whether or not the claim intends the scope to cover the power supply circuit or to a combination of the power supply circuit/in-body information acquiring apparatus. The Examiner concludes that claim 13 should be properly amended.

In response, applicants have significantly amended claim 13 as set forth above, in which any language regarding the in-body information acquiring apparatus has been deleted. Claim 13 as amended recites a power-supply circuit including a power unit. The power unit includes a first power unit that includes a cell that outputs a first current in a current value range in which the larger the current that is drawn from the cell, the smaller the electric discharge capacity of the cell, a second power unit that includes a cell and that outputs a second current in a current value range in which the larger the current that is drawn from the cell, the smaller the effective electrical discharge capacity of the cell and a switch that selectively connects any one of the first power unit and the second power unit to a load.

Hence, claim 13 as amended, and claims 14-16 that depend from claim 13, are now clearly directed to the power supply circuit alone, not a combination of the power supply circuit and in-body information acquiring apparatus. Applicants, therefore, respectfully assert that claims 13-16 comply with 35 USC §112, Second Paragraph, and respectfully request withdrawal of the rejection of claims 13-16 thereunder.

Response to Rejections Under 35 USC §102

Claims 13 and 14 were rejected under 35 USC §102(b) in view of US Patent No. 688,009, to Siegel, et al. (Siegel). With respect to claim 13, directed only to the power supply circuit, the Examiner asserts that Siegel discloses a power unit including a first power unit (a), and a second power circuit (b) and a switch (7) that selectively connects any one of the first power unit and the second power unit to a load for a predetermined period [page 1, col. 2, lines 71-95]; and with respect to claim 14 that the first and second power units can include a plurality of cells. Applicants respectfully disagree for at least the following reasons

Applicants' invention provides a low cost power supply circuit, including a power unit, for use with a load, one example of which is the in-body information acquiring apparatus. The low cost power supply circuit enables the use of cells that are available in the marketplace at a lower price than custom made cells (as set forth at page 2, lines 6-8 of the Specification). Commercially available cells are sufficiently small for use in an in-body information acquiring apparatus, and are constructed to output a minute current up to 0.1 mA (as set forth at page 8, lines 5-8 of the Specification). Such a current output, however, is much lower than the 5mA current required to operate the in-body information acquiring apparatus. Where such a large current, i.e., 5 mA, is continuously drawn from the small commercially available cells as described, they do not last (remain operational) for the period corresponding to the nominal electrical discharge capacity thereof (as set forth at page 8, lines 20-25 of the Specification).

Accordingly, using such cells to supply the higher current in power supply applications (as the power supply circuit is intended) would deplete the cells. Using depleted

cells affects operation of apparatus (load) requiring the higher current, such as the in-body information acquiring apparatus. That is, the small or depleted cells would only provide sufficient power for operating for a very short time, significantly less than time required for normal operation, for example, in a load such as the in-body information acquiring apparatus, also described in the Specification.

The instant invention solves this problem by employing a switch for giving the cells a periodic rest during operation with a load. While directed broadly to any load, the invention as claimed preferably supplies the requirements of the in-body information acquiring apparatus. The power supply circuit is constructed (claim 13 as amended) to allow a lifetime of each individual cell that corresponds to the nominal electrical discharge capacity thereof at the higher current needs of load such as the in-body information acquiring apparatus. Hence it is an important feature and advantage of the invention that it enable such cells to be used to supply a current that is substantially higher than the current the cells are specified to output, i.e., 0.1 mA. Again, such feature enables that same commercial available cells can be used for supplying a higher current drawing load, e.g., the in-body information acquiring apparatus, resulting in significantly reduced costs. Independent claim 13 is amended to clearly reflect the structure and function.

While the Siegel patent does disclose an automatic means for conserving energy of electric batteries, Siegel does not set forth each and every element of applicants amended independent claim 13, as required under 35 USC §102. Siegel's automatic means for conserving energy of electric batteries is not the equivalent of applicants' power-supply circuit

because it is not intended or operational to periodically switch power units (cells) because they are operated in a nominal current value range that is substantially higher than the specified output or nominal range of the power units (cells) it comprises.

Hence, applicants respectfully assert that claim 13 is patentable under Section 102 in view of Siegel. Claim 14 depends from claim 13 and is patentable therewith. Applicants, therefore, request that the rejection of claims 13 and 14 under Section 102 in view of Siegel be withdrawn.

Response to Rejections Under 35 USC §103

Claims 15 and 16 were rejected under 35 USC §103(a) in view of Siegel. To support the rejection, the Examiner asserts that Siegel discloses the claim 13 power supply circuit, from which claims 15 and 16 depend, but fails to disclose the specific type of cell. The Examiner reasons that Siegel is generic to any battery cell, and that a use of any known electric or battery cell would be a mere obvious selection.

Applicants respectfully disagree. Applicants' power supply circuit of amended independent claim 13 (from which claims 15 and 16 depend) is arranged to operate so that the cells or power units may be overdriven periodically, not merely periodically switched during normal operation as disclosed by Siegel. In Siegel, the power units or cells are not overdriven as specified, but merely switched during normal operation to conserve the individual battery state of each cell. When a battery cell outputs a current within a current value range that the cell is intended or specified to operate within, the cell lasts for a period of time corresponding to the

nominal or intended electric discharge of the cell. But when the same battery cell or power unit continuously outputs a current within a current value range that is substantially higher than the intended current draw, the cell's effective electrical discharge capacity is reduced. The reduction of electrical discharge capacity increases with the amount of current drawn from the cell by a load (see applicants' Specification at page 8, through page 9, line 25)

Hence, the wording added to amend claim 13: "a current value range in which the larger the current that is drawn from the cell, the smaller the effective electrical discharge capacity of the cell" defines the feature in which the cell outputs a current that is substantially higher than the current which the cell has been manufactured or specified to output. This feature is not disclosed or suggested by Siegel as mentioned above. For that matter, and as mentioned above with respect to the response to the claim 13 rejection in view of Siegel under Section 102, each of the elements of claim 13 are not found in Siegel. Hence, for the reasons stated, claims 15 and 16 are patentably distinct from Siegel under Section 103(a). Applicants, therefore, respectfully request that the rejection of claims 15 and 16 under Section 103(a) in view of Siegel be withdrawn.

Claims 20-22 were rejected under 35 USC §103(a) over US Patent No. 7,116,352 to Yaron, in view of Siegel. To support the rejection, the Examiner asserts that Yaron discloses an in-body information acquiring apparatus (882, Fig. 28) with an image sensor (888), a communication unit (898) and a power supply (890), and that Yaron discloses that its power supply can be a battery (col. 29, cols. 19-22). Applicants, however, respectfully disagree.

Yaron is not found to disclose applicant's claimed in-body information acquiring apparatus at least because they fail to disclose the claimed power unit. That is, Applicants independent claim 20, as amended, sets forth an in-body information acquiring apparatus. The apparatus comprises a function-executing unit that realizes a predetermined function inside a body of a patient and a power unit. The power unit includes: 1) a first power unit that includes a cell that outputs a first current in a current value range in which the larger the current that is drawn from the cell, the smaller the electric discharge capacity of the cell; 2) a second power unit that includes a cell and that outputs a second current in a current value range in which the larger the current that is drawn from the cell, the smaller the electric discharge capacity of the cell; and 3) a switch that selectively connects any one of the first power unit and the second power unit to the function executing unit for a predetermined period.

While the Examiner asserts that Yaron fails to disclose a second power unit and a switch to selectively connect other power units in place of Yaron's power unit, applicants understand that the power unit is distinct from the Siegel power unit, as explained above with respect to the section 102 rejection of claim 13. So while the Examiner asserts that Siegel establishes periodically switching between such cells or power units to extend the life of same (Siegel at page 1, col. 1, lines 18-25), and that it would have been obvious to combine an in-body information acquiring apparatus of Yaron with a power supply of Siegel to realize an in-body information acquiring apparatus with the power unit as set forth in applicants' claim 20, this is inaccurate. The power unit is not equivalent to Siegel's.

Moreover, Yaron's Fig. 28 describes a system 880, which includes a capsule 882. Capsule 882 includes a lens layer 886 attached to a lens sensor array 888, a single battery power supply 890, a processor 892, a memory unit 894, a transceiver 898, a light source 912, a light dispersing unit 918 and an optical assembly 910. This is readily distinguishable from applicants' invention as set forth in claim 20 because it is not equivalent of applicants' claimed function executing unit, which performs a predetermined function inside a body of a patient. For that matter, since Yaron only includes a power supply 890 that is a single battery (col. 29, line 19), the Yaron inventors were not challenged to find a reduction in size of the battery source, do not refer in any way to a need for a prolonged battery life, or any need for a smaller size without affecting the desired service life, as asserted by the Examiner.

Hence, combining Yaron's Fig 28 system 880 and capsule 882 with the Siegel power supply would still not realize an in-body information acquiring apparatus as set forth in applicants' claim 20. Applicants, therefore, respectfully assert that claim 20, and claims 21 and 22, which depend from claim 20, are patentable in view of the proposed combination of Yaron and Siegel under Section 103(a), and request withdrawal of the rejections thereunder.

Conclusion

In concluding, applicants respectfully assert that hereinafter, claims 13-16 and 20-22 overcome any objections, comply the first and second paragraphs of 35 USC Section 112, and overcome the art rejections based on Siegel alone under Sections 102 and 103, and Siegel and Yaron under Section 103.

If the Examiner believes that a telephone conference with applicants' attorneys would be advantageous to the disposition of this case, the Examiner is asked to telephone the undersigned.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'John F. Vodopia', written over the printed name.

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